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OF THE

MONTANA STATE BOARD

OF

HORTICULTURE

1899-1900

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FIRST

BIENNIAL REPORT

OF THE

MONTANA STATE BOARD

OF

HORTICULTURE

TO THE

LEGISLATIVE ASSEMBLY

OF THE

STATE OF MONTANA

FOR THE YEARS

1899-1900

Officers and Members of the Board.

I. D. O'Donnell, President, First District, Billings.

S. M. Emery, Second District, Bozeman.

C. H. Campbell, Third District, Great Falls.

D. E. Bandmann, Fourth District, Missoula.

J. H. Edwards, Fifth District, Kalispell.

Hon. R. B. Smith, Ex-Officio Member, Helena.

C. H. Edwards, Secretary, Missoula.

Inspectors.

I. D. O'Donnell First District, Billings, Yellowstone Co.

Prof. R. A. Cooley, Second District and Inspector at Large for the State, Bozeman, Gallatin Co.

C. H. Campbell, Third District, Great Falls, Cascade Co.

W. B. Harlan, Fourth District, Como, Ravalli Co.

E. E. Parsons, Fifth District, Kalispell, Flathead Co.

W. K. Semple, Resident Fruit Inspector, Butte, Silver Bow Co.

E. N. Brandegee, Resident Fruit Inspector, Helena, Lewis and Clarke Co.

LETTER OF TRANSMITTAL.

Office of State Board of Horticulture,
Missoula, Mont., January 1, 1901.

TO HIS EXCELLENCY,

ROBERT B. SMITH,

GOVERNOR OF MONTANA.

In accordance with law we have the honor to submit the First Biennial Report, Volume I., of the Montana State Board of Horticulture for the years 1899 and 1900.

I. D. O'DONNELL,
President.

C. H. EDWARDS
Secretar[illegible].

REPORT

OF THE

MONTANA STATE BOARD HORTICULTURE

TO GOVERNOR

To His Excellency

ROBERT B. SMITH,

Governor of Montana

To the Governor and the Legislative Assembly of the State of Montana:

In compliance with the provisions of law, I have the honor to submit for your inspection and consideration the following report of the work of the State Board of Horticulture and its officers and appointees for the two years of its existence, and matters pertaining thereto.

The law creating this board was passed in February, 1899, and in obedience thereto the governor appointed the following persons as members, the governor himself being ex-officio member of the board: I. D. O'Donnell of Billings, S. M. Emery of Bozeman, Paris Gibson of Great Falls, D. E. Bandmann of Missoula and J. H. Edwards of Kalispell.

The board organized by the election of Mr. O'Donnell as president and Chas. H. Edwards of Missoula as secretary.

Paris Gibson has since resigned as a member of the board and Mr. C. H. Campbell, of Great Falls, was appointed to fill the vacancy.

As provided by law, lots were drawn to determine whose terms should expire in two years and whose should continue the full four years. Messrs. Emery and Campbell drew the short term, and Messrs. O'Donnell, Bandmann and Edwards hold for the long term.

The secretary's office was located in Missoula and the secretary at once entered upon the discharge of his duties, furnishing a room for his office without expense to the board. At the first meeting of the board the following inspectors were appointed:

I. D. O'Donnell, Billings, for First District.

Dr. E. V. Wilcox, Bozeman, Second District and Inspector-at-Large for the State.

C. H. Campbell, Great Falls, Third District.

W. B. Harlan, Como, Fourth District.

J. H. Edwards, Kalispell, Fifth District.

Prof. R. A. Cooley was later appointed to fill vacancy caused by resignation of Dr. Wilcox.

These inspectors have done their part in carrying out the provisions of the law and the Rules and Regulations adopted by the board, and a summary of their reports is included in this report.

The law creating the State Board of Horticulture, together with the Rules and Regulations adopted by said board and now in force, is given in this connection and is as follows:

AN ACT

To Create the Montana State Board of Horticulture, to Prescribe Its Powers and Duties, and to Appropriate Money Therefor.

Be it enacted by the Legislative Assembly of the State of Montana:

Section 1. There is hereby created a State Board of Horticulture, to consist of six (6) members, five of whom shall be appointed by the governor, one from each of the horticultural districts that are hereby created, and the State Executive, who shall be an ex-officio member of the board. No person shall, however, be appointed on said board, or employed by them, who shall be connected in any way with any nursery, or who shall be engaged in the sale or handling for profit of any nursery product.

Section 2. The state shall be divided into the following horticultural districts: The first district shall comprise the counties of Dawson, Custer, Yellowstone, Sweet Grass, Carbon and Park; the second district shall comprise the counties of Gallatin, Madison, Jefferson, Beaverhead, Silver Bow, Lewis and Clarke, Meagher and Broadwater; the third district shall comprise the counties of Cascade, Fergus, Valley, Choteau and Teton; the fourth district shall comprise the counties of Missoula, Ravalli, Granite and Deer Lodge; the fifth district shall comprise the county of Flathead.

Section 3. The members shall reside in the district for which they are appointed. They shall be selected with reference to their study of, and practical experience in horticulture, and the industries dependent thereon. They shall hold office for a term of four years, and until their successors are appointed and qualified; provided, however, that two of the board first appointed—to be determined by lot—shall retire at the expiration of two years. All vacancies in the board shall be filled by appointment of the Governor, and shall be for the unexpired term.

Section 4. The board is authorized to employ a secretary, and prescribe his duties, who shall hold his appointment at the pleasure of the board. Before entering upon the discharge of his duties, each member and employe of the board shall take and subscribe to the oath of office, which said oath shall be filed with the Secretary of State.

Section 5. The board may call together and hold, in conjunction with horticultural societies, public meetings of those interested in horticulture and kindred pursuits, and may publish and distribute such proceedings and discussions as in its judgment may seem proper, provided the sum so expended shall not exceed the sum of $300 per annum.

The board shall meet on the third Monday of February and September of each year, and as much oftener as it may deem expedient.

Section 6. The office of the board shall be located at such place as the majority thereof may determine, and shall be in charge of the secretary during the absence of the board.

Section 7. For the purpose of preventing the spread of contagious diseases among fruit and fruit trees, and for the prevention, treatment, cure and extirpation of fruit pests and diseases of fruits and fruit trees, and for the disinfection of grafts, scions or orchard debris, empty fruit boxes or packages, and other suspected material or transportable articles dangerous to orchards, fruits and fruit trees, said board may prescribe regulations for the inspection and disinfection thereof, which regulations shall be circulated in printed form, by the board, among the fruit growers and fruit dealers of the state, and shall be published at least ten days in two horticultural papers of general circulation in the state, and shall be posted in three conspicuous places in each county in the state, one of which shall be at the county court house thereof.

Section 8. The said board shall elect from their own number or appoint from without their number, to hold office at the pleasure of the board, one competent person in each district, to be known and act as "Inspector of Fruit Pests." Said inspectors shall be selected with reference to their study and practical experience in horticulture. It shall be the duty of said inspectors to visit the nurseries, orchards, stores, packing houses, warehouses and other places where horticultural products and fruits are kept or handled within their respective districts, and to see that the regulations of the State Board of Horticulture to prevent the spread of fruit pests and

diseases of trees and plants, and the disinfection of fruits, trees, plants, grafts, scions, orchard debris and empty fruit boxes and other material shall be fully carried out and complied with. Said inspectors shall have free access, at all times, to all the premises where any trees, plants, fruits or horticultural products or supplies are kept or handled, and shall have full power to enforce the rules and regulations of the State Horticultural Board, and to order the destruction or disinfection of any or all trees, plants, fruits or horticultural products or supplies found to be infected with any disease as prescribed or designated by said board.

Section 9. It shall be the duty of every person or persons, corporation or corporations, who shall sell or deliver to any person or persons, corporation or corporations, any trees, plants, vines, scions or grafts, to notify the inspector of said district wherein such trees, plants, vines, etc., etc., are to be delivered, at least five days before said goods are to be delivered, giving the date and nursery or railroad station where said trees, plants, scions, etc., etc., are to be delivered, together with the name of the party or parties who are to receive the same. It shall be the duty of the inspector receiving such notice to inspect the said trees, plants, grafts, scions, etc., etc., as soon thereafter as practicable, and at the point where the same are to be delivered, and if the same be found free from any and all diseases or pests, as designated by said State Board of Horticulture, he shall so certify and shall attach such certificate to each lot or bill of such trees, grafts, scions, vines, etc., etc., which said certificate must contain a list of the said trees, grafts, scions, vines or plants so inspected. But if any of the trees, grafts, scions, vines or plants so inspected shall be found to be diseased or infested with any of the pests, as prescribed by said board, then the inspector shall order the destruction of such trees, grafts, scions, vines, etc., etc., so diseased or infested, together with all boxes, wrapping or packing pertaining thereto.

Section 10. If any person or persons in charge or control of any nursery, orchard, storeroom, packing house or other place where horticultural products or supplies are handled or kept, shall fail or refuse to comply with the rules and regulations of the said State Board of Horticulture, or shall fail or refuse to disinfect or destroy any diseased or infected trees, plants, vines, scions, grafts, shrubs or other horticultural supplies or products, when ordered so to do, by the inspector of such district, he shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined in any sum not less than $25 nor more than $300.

Section 11. It shall be the duty of every owner or manager of every orchard, nursery, storeroom, packing house or other place where horticultural products or supplies are kept or handled, which shall become diseased or infected with any injurious insect or pest, to immediately, upon discovery of the existence of such disease or pest, to notify the inspector of said district of the existence of the same. It shall be the duty of such

owner or manager, at his own proper expense, to comply with and carry out all the instructions of said inspector for the eradication of said disease or pests. Any person who shall fail or refuse to notify said inspector, as herein provided, or who shall fail or refuse to comply with the instructions of said inspector for the eradication of any disease or pest, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than $25 nor more than $300.

Section 12. If any person or persons, corporation or corporations, shall fail or refuse to forthwith comply with the instructions of said inspector, for the eradication of any disease or pest, said inspector shall proceed forthwith to eradicate such disease or pest and the expense of the same shall become a charge and lien upon the property of such owner.

Section 13. Every person who, for himself or as agent for any other person or persons, corporation or corporations, tansportation company or common carrier, shall deliver or turn over to any person or persons, corporation or corporations, any trees, vines, shrubs, nursery stock, scions, grafts, without first having attached the inspector's certificate, as provided in Section 9 of this Act, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in a sum not less than $25 nor more than $300.

Section 14. No person or persons, corporation or corporations, shall be liable to any other person or persons, corporation or corporations for any damage to any trees, vines or shrubs, nursery stock, scions or grafts by reason of the same being held to await the certificate of the inspector, as provided in Section 9 of this Act.

Section 15. The inspectors of fruit pests appointed or elected by said board, shall receive as compensation for their services the sum of $5.00 (five dollars) per day for the time actually employed; provided, however, that no inspector shall receive more than three hundred dollars in any one year, when acting as such inspectors of fruit pests. The members of said board shall receive no compensation for their services, except actual expenses paid out. The secretary of said board shall receive the sum of $1,000 per annum for his services.

Section 16. All bills for expenditures, under this Act, shall be audited and passed upon by the said Board of Horticulture, and if found legal and just, shall be allowed, subject to the approval of the State Board of Examiners, and a warrant shall be drawn therefor upon the auditor of the State of Montana, who shall draw his warrant upon the State Treasurer therefor.

Section 17. It shall be the duty of the secretary to attend all meetings of the board and to procure records of the proceedings and correspondence, to collect books, pamphlets, periodicals and other documents containing valuable information relating to horticulture, and to preserve the same; to collect statistics and other information showing the actual con-

dition and progress of horticulture in this state and elsewhere; to correspond with agricultural and horticultural societies, colleges and schools of agriculture and horticulture, and other persons and bodies as may be directed by the board, and prepare, as required by the board, reports for publication; he shall also act as assistant to, and obey the directions of the inspectors of fruit pests, under the directions of the board.

Section 18. The board shall, biennially, in the month of January, report to the Legislature a statement of its doings and abstracts of the reports of the inspectors of fruit pests, and of the secretary.

Section 19. There is hereby appropriated for the use of the State Board of Horticulture, as set forth in this Act, out of the moneys in the state treasury not otherwise appropriated, the sum of three thousand dollars ($3,000), or as much thereof as may be necessary for the year commencing March 1, 1899, three thousand six hundred dollars ($3,600), or as much thereof as may be necessary, for the year commencing March 1, 1900.

Section 20. All sums of money collected as fines for violations of any of the provisions of this Act shall be turned into the state treasury for use in defraying the expenses of the board hereby created, and the appropriations hereby made shall be paid out of the fund to the extent of the money therein contained.

NURSERY STOCK.

The term nursery stock, under the law, is construed to mean and include fruit, shade, and ornamental trees (deciduous or evergreen), shrubs, vines, plants, roots, bulbs, buds, scions, cuttings, or other portions of plants, shrubs or trees designed to be replanted in Montana for home or commercial use.

Rules and Regulations of the State Board of Horticulture.

For the purpose of preventing the importation and spread of contagious diseases among fruits, fruit trees and nursery stock and for the treatment, cure and extirpation of fruit pests, the Montana State Board of Horticulture, establish (in accordance with an Act to create the Montana State Board of Horticulture, to prescribe its powers and duties, approved February, 1899), the following rules and regulations and ask the earnest co-operation of all fruit growers, dealers and all persons interested in maintaining the present high grade of Montana fruit, in carrying out the important work.

Rule 1. The Inspector at Large for the State of Montana shall inspect and fumigate, or cause to be inspected and fumigated, all nursery stock, trees, plants, vines and cuttings grown or growing within the State of Montana, and shall have authority to order all nursery stock, trees, plants, vines and cuttings used for filling orders, to be disinfected by fumigation or other method, when, in his judgment such is necessary. After such inspection, if it be found that said nursery stock, trees, plants, vines and cut-

tings, are clean and free from insects and fungi pests, he shall issue his cetificate to said nurseryman, and said certificate shall entitle him to use said stock, so inspected and disinfected, for filling nursery orders for the next current delivery.

Rule 2. All nursery stock, trees, plants, vines and cuttings of any kind shipped into or brought into the State of Montana, before delivery to the purchaser shall be unpacked from the boxes, and in case of baled and burlaped shipments these coverings shall be removed and the stock fumigated as hereinafter provided, as follows:

All nursery stock, trees, plants, vines and cuttings transported over the Northern Pacific Railway from the west, shall be inspected and fumigated at the city of Missoula.

All such nursery stock, trees, vines, plants and cuttings, transported over the Oregon Short Line from the south, shall be inspected and treated at Dillon.

All nursery stock, trees, plants, vines, and cuttings transported over the Northern Pacific Railway from the east, or over the Burlington Railway, shall be inspected and treated at Miles City or Billings.

All such nursery stock, trees, plants, vines and cuttings, transported from the west over the Great Northern Railway, shall be inspected and treated at Kalispell.

All such nursery stock, trees, plants, vines and cuttings, transported from the north over the Great Falls and Canada Railway, and from the east over the Great Northern Railway, shall be inspected and treated either at Glasgow, Chinook, Fort Benton or Great Falls.

All such nursery stock, trees, plants, vines and cuttings, brought into the State of Montana by wagon shall be inspected and treated at the nearest quarantine station, as hereinafter mentioned, to the point where such nursery stock, trees, plants, vines and cuttings enter the state.

The said cities of Billings, Miles City, Dillon, Missoula, Kalispell, Great Falls, Fort Benton, Chinook and Glasgow are hereby designated as quarantine stations, where all nursery stock, trees, plants, vines and cuttings shall be inspected and fumigated, except as otherwise provided for in these rules and regulations.

The certificate of the inspector making such examination and inspection shall exonerate the shipper and consignee from any and all penalties provided by law.

Rule 3. Importers or owners of nursery stock, trees, plants, vines and cuttings who shall desire to have such nursery stock, trees, plants, vines and cuttings, inspected and fumigated at points in Montana, other than the regular quarantine stations, may have such inspection and fumigation made at any point designated by such importer or owner; provided, however, that such importer or owner shall pay all charges of inspection and fumigation, and all expenses of the officer employed in such inspection and fumi-

gation, such charges and expenses to be paid before a certificate is granted.

Rule 4. All boxes, packages, wrapping and packing used in the importation of nursery stock, trees, plants, vines and cuttings into the State of Montana shall be destroyed by burning the same as soon as emptied of their contents.

Rule 5. It shall be unlawful for the owner or importer of any nursery stock, trees, plants, vines and cuttings to allow any of the debris of such nursery stock, trees, plants, vines and cuttings to accumulate or to become a menace to the fruit industry; and the destruction of all such debris is hereby ordered, and the inspector of each district will see that all such debris is destroyed by burning.

Rule 6. The inspector of each district shall inspect or cause to be inspected, each and every orchard within his district annually. He shall see that the owner or owners of any premises where trees, plants, vines, etc., are growing shall obey the instructions of the state board.

Rule 7. It shall be unlawful for any person to spray any tree, plant vine or shrub when the same is in bloom, with any substance injurious to bees or honey.

Rule 8. In the absence of the inspector of any district or in the event that he cannot perform, for any reason, the work required, the member of the State Board of Horticulture for said district may appoint temporarily such assistant inspectors as may be necessary for such work.

Rule 9. All inspectors shall, at the close of each month, report to the secretary of the board a complete statement of his doings, upon the proper blanks furnished for that purpose, together with an itemized bill for his labor for the time actually served by him during such month, which bill, when properly audited by the member of the State Board of Horticulture for the district in which said inspector shall labor, which bill will be again audited by the president and secretary of the state board and forwarded to the state board of examiners for payment.

Rule 10. Inspectors shall receive as compensation the sum of five dollars for each and every day actually served, but such inspector shall pay his own expenses.

Rule 11. All inspection and fumigation shall be under the charge and supervision of the inspector-at-large, and all inspectors shall be responsible to him.

Rule 12. The inspectors appointed by this board are authorized to inspect any and all nursery stock, trees, plants, shrubs, vines, or the products thereof, and to collect the fees prescribed in these rules and regulations from the owner or person in control of such nursery stock or products, wherever found.

Rule 13. For the inspection or treatment of each and every carload of nursery stock a fee of $10 shall be charged to cover expense of inspection and fumigation.

Rule 14. It is hereby ordered that all green fruits and all citrus fruits found for sale in Montana, shall be inspected and if found free of any disease or infection, shall be branded "Inspected and Passed," but if found to be infested with injurious insects or disease, shall be condemned and destroyed by burning.

Rule 15. For the inspection of all green fruits and citrus fruits, a fee of two (2) cents per box or package, with a maximum charge of $5 for each separate lot inspected.

Rule 16. All fees collected for inspection and fumigation shall be turned over by inspectors to the secretary of the board, and shall be paid out on the order of the president and secretary and member of the board for the district in which said fees are collected.

Rule 17. It shall be the duty of each person or corporation offering to sell or selling and delivering any nursery stock, trees, plants, vines, scions, cuttings, etc., within the State of Montana to place on each and every package so sold and delivered a label or card stating whether or not said trees, plants, vines, scions, cuttings, etc., were grown in the State of Montana or otherwise.

By fumigation is to be understood treatment with hydrocyanic acid gas. This treatment should be done as follows: All nursery stock to be treated should be placed in an air-tight tent or box. For every 100 cubic feet of space in box or tent, take one ounce (avoirdupois weight), of fused potassium cyanide, 98 per cent. strength, preferably in lumps about the size of a walnut; one and one-half ounces commercial sulphuric acid, best grade, and two and one-fourth fluid ounces of water. First place the water in a three-gallon vessel (which may be of glazed earthenware); to this add the acid and finally the potassium cyanide. (The cyanide would better be enclosed in a small paper bag in which a hole is torn). Immediately close the doors or openings, taking all precautions against inhaling the gas, which is one of the most violent poisons known. After leaving box or tent closed for 40 minutes, open all doors and allow at least one hour for thorough ventilation before attempting to remove the stock. No injury is caused to nursery stock if the gas is left in more than 40 minutes.

List of insects and fungi to guard against:

San Jose Scale.
Oyster Shell Bark Louse.
Woolly Aphis.
Codling Moth.
Flathead Apple Tree Borer
Blister Mite of the Pear.

Fungi:

Apple Rust.
Black Knot of Plums.
Twig Blight of the Pear.
Leaf Blight of the Apple

DIP FOR NURSERY STOCK AND WINTER SPRAY FOR SCALE INSECTS

Place ten pounds of lime and twenty pounds of sulphur in a boiler with 20 gallons of water and boil briskly for two hours, then put twenty pounds of lime in a cask and slack it with water. Add 15 pounds of coarse salt; when dissolved add this to the lime and sulphur and boil half an hour longer. Apply lukewarm.

SUMMER SPRAY FOR GREEN APHIS.

Quassia chips	8 pounds.
Whale Oil soap	7 pounds.
Water	100 gallons.

Boil the quassia chips in water one hour. Dissolve the soap in hot water, strain both and mix together. Add enough water to make 100 gallons. This remedy is to be used with a spray pump with good force. It does not injure the foliage.

BORDEAUX MIXTURE FOR FUNGUS DISEASES.

Sulphate of Copper (bluestone)	4 pounds.
Fresh Lime	4 pounds.
Water	50 gallons.

Place 25 gallons of water in a barrel, hang four pounds of bluestone in the water, enclosed in a piece of gunny sack; slack four pounds of lime carefully; then add enough water to make 25 gallons. Run the lime milk through a fine wire strainer, then mix with copper sulphate solution. Spray before the buds open, before the blossoms open, and again after the blossoms have fallen.

HELLEBORE FOR PEAR AND CHERRY SLUGS, GOOSEBERRY AND CURRANT WORMS.

The hellebore may be dusted on dry with a blowing machine, or if preferred steep one ounce of hellebore in a gallon of water, and use as a spray.

PARIS GREEN FOR CODLING MOTH, CATERPILLARS AND LEAF EATING INSECTS.

Paris Green	4 ounces.
Water	50 gallons.
Slacked lime	1 pound.

Strain the lime after slacking as in making the Bordeaux mixture. Dissolve the Paris Green as well as possible; mix and apply as a spray.

Paris Green is often badly adulterated. Be careful to secure it of reliable parties who will guarantee its quality.

The first work of the secretary was to prepare for publication the rules and regulations as adopted by the board, and when printed, together with the law, to distribute the same as early and as widely as possible. 2,500 copies of this pamphlet were printed and sent out to members of the board, the fruit dealers of the state and to all nurserymen and fruit growers whose

names it was possible to obtain, also to the press, and to all firms who shipped fruit and nursery stock into Montana. One hundred and fifty large sheets containing the same matter were posted throughout the state. Over 1,000 circulars upon different subjects were prepared and sent out; also a small bulletin upon Insects, Insecticides and Fungicides was prepared by Prof. Cooley and was printed and distributed from the secretary's ofice to the number of 2,000 copies.

An inspector's stamp was procured and sent to each inspector with which to stamp all packages of fruit passing inspection.

The correspondence of the office has been a large one, covering the entire United States and many from abroad. All correspondence is kept on file.

A circular letter was sent to growers inquiring as to injury to trees from the extremely hard winter of 1898-99, and a great many replies were received, and the information thus gained was summarized and published, and forms a valuable addition to our knowledge of fruit growing in Montana.

As provided by the law, the laws, rules and regulations were posted in the court houses and other places in each county in the state.

Under direction of the board, cyanide used in fumigating nursery stock was purchased at wholesale and placed at the Montana Experiment Station, and from there distributed to inspectors at a saving of 50 per cent. on its cost.

Much correspondence has been had with the different railroad companies in regard to quarantine stations, fumigation of imported nursery stock, etc., and their hearty co-operation in the work of the board was secured.

Monthly reports for the use of inspectors, certificates of inspection, orchard reports, etc., were gotten up with the assistance of Prof. Traphagan, Mr. Harlan and Mr. Colville and sent to all inspectors with instructions as to their use.

A request was made for copies of the reports of the different State Horticultural and Agricultural Societies and for the bulletins of the various experiment stations, which request was very generally complied with and a nucleus of a very valuable horticultural library has thus been gathered.

A circular calling especial attention to the provisions of the law regarding the importation of infested fruits was sent to all fruit dealers and published in many papers of the state, as well as those published in sections from which we import our fruit. This, we believe, has had much influence in keeping out of the state much of that disgustingly infested fruit that has heretofore been dumped into our cities and forced upon the consumers.

The board has held six regular and special meetings, at Hamilton, Missoula, Helena and Plains.

They were confronted with a serious problem in the adoption of such

rules for the enforcement of the law as would result in protecting our orchards from the insect and fungus pests that are injuring and destroying the trees in nearly every other state in the Union, and from which ours are as yet free, and to protect the fruit consumer from the vilely infested fruits that because of our previous lack of all law upon the subject could be shipped to our markets with impunity, and to our markets only, as all other states had laws protecting them from such importation.. At the same time they had to see that no rights of shipper, importer or consumer were trampled upon and that no unnecessary hardship was placed upon them. They feel that they have accomplished this, and that for the short time the law has been in operation the results are highly satisfactory.

The work done by the inspectors of orchards and fruits, both in quantity and quality, show the wisdom of their appointments.

With strict economy the expenditures have been kept within the appropriation, although to do this has hampered their work considerably, particularly in the inspection of fruits.

The members of the board have attended the meetings of the State Horticultural Society and the meetings of local societies and Farmers' Institutes, and have in every way given support and encouragement to such meetings.

Mr. Emery of the board attended as a delegate from Montana the meeting of the Northwestern Fruit Growers' Association, at Tacoma, and was made a vice president thereof, and the Montana Horticultural Society was admitted as a member of the association.

EARLY HISTORY OF FRUIT GROWING IN MONTANA.

While commercial fruit growing in Montana is an industry of only a few years existence, the first trees were planted about 35 years ago. Thomas W. Harris on Three Mile near Stevensville, Bitter Root valley, was probably the first person to try planting apple trees in 1866. Next year others, notably Jas. Meinsinger, W. N. Smith and Wm. McWhirk obtained some trees from Philip Ritz of Washington territory and planted them. Some of those old trees are still living and bearing fruit but the most of them were of unsuitable varieties or were poorly cared for and have long since disappeared.

In 1870, Bass Bros. began planting the orchard that has since brought in its thousands of dollars to its owners and proven fruit growing not only possible but profitable.

By 1880 a number of small orchards were to be found in what is now Missoula and Ravalli counties, but probably a thousand boxes in the state would have been a large estimate. In 1890 the number of trees had swelled into the thousands and the output of fruit was correspondingly large.

Still fruit growing was not yet looked upon as a profitable or legitimate

calling in Montana. Those who had planted out large numbers of trees were looked upon as cranks, and the masses of the people living in the fruit belt itself did not realize that those whose trees were in bearing were making money from them.

But in 1893 a revelation and a change came about. In the fall of that year the first fruit fair was held at Stevensville and those who came and saw doubted no longer. Immense quantities of apples, pears, plums and grapes were shown there of the finest size, quality and appearance ever seen in any country and best of all, the fruit was entirely free from blemishes or insect pests of any kind.

The exhibit was taken to Butte and Helena and there viewed by thousands who, until then, had scarcely heard that fruit could be grown in Montana and were astounded to find that it was so perfect in every way and embraced so many varieties.

Then came the fruit growing or rather planting boom over all western Montana. Every one who owned land planted an orchard. People from Butte, Anaconda, Helena and other parts of the state bought land and set out fruit trees by the tens of thousands. Stock companies were formed and they planted still larger orchards until today there are in Ravalli county alone, which does not take in all of the Bitter Root valley, over 350,000 fruit trees and the crop this year—1900—was estimated by the state inspector at 65,000 boxes of one bushel each.

Missoula county is only second to Ravalli in the number and extent of its orchards, while thousands of trees have been planted in Flathead county, and many in other portions of the state.

In size, beauty and quality the apples grown in Montana are unsurpassed. So far they are free from the disgusting worms, and it is the object and intent of the State Horticultural Board to prevent our fruit becoming infested and defiled by the maggot of the codling moth or other insect or fungus pest. So far our trees are free from any serious disease or insect troubles. Thousands of trees of varieties too tender for our climate have been planted, as proven by the results of the hard winter of '98-99. But those killed or seriously injured have been replaced and fruit growing seems now to be upon a sure, firm basis and with promise of a great future.

This is a matter of interest and concern, not only to those who are engaged in fruit production, but to the fruit consumers as well, who are benefitted by having clean, healthful, delicious fruit.

ORCHARD STATISTICS.

The inspectors have made a very thorough inspection of the orchards in Bavalli, Missoula, Flathead and Yellowstone counties, where most of the fruit trees are found, but were unable to visit all the orchards in other counties, where but few trees are planted, and they in widely separated localities. Mr. Harlan reports by far the larger number from Ravalli county, there being 245 orchards, containing 342,415 trees of 156 varieties.

Missoula county comes next with 209 orchards and 152,529 trees, and Flathead with 208 orchards and 56,560 trees.

The totals for the state as returned by inspectors are:

Six hundred and ten thousand trees, of which 555,545 are apples, 12,647 pears, 22,677 plums, 17,820 cherries and 1,650 peaches.

This total should be increased by probably 10 per cent. for small and outlying orchards not visited. These figures do not include the planting of the past season, which is estimated at 250,000, making a grand total of trees now planted and growing in the state of 900,000.

There is no reason to doubt that this rate of increase will be kept up for the next five or ten years, by which time the industry will have assumed enormous proportions.

That it is a permanent one, no one conversant with the facts can doubt, and that it is as worthy of encouragement as sheep or cattle raising, or any other branch of husbandry, is beyond dispute.

Something over 110,000 bushel boxes of apples were grown in the state in the past season. A fair crop of pears and plums, and an enormous crop of cherries were grown.

Less than ten per cent. of the trees have arrived at full bearing age.

There is no reason to doubt that within five years the yield of the orchards of Montana will exceed half a million boxes, and a million within ten years, which at a fair valuation of $1.00 per box, would make a million dollars annually paid out to the citizens of our state instead of being sent to other states, for by far inferior fruits. The standard California apple box of 10x11x20½ inches inside measurement has been adopted in this state and the same is now used by California, Oregon, Washington, Idaho and Montana. It was found impracticable to obtain statistics that would be accurate or do justice to the small fruits. Suffice it to say that strawberries are grown and marketed in immense quantities, while in quality they are unsurpassed by the berries of any other state.

Large quantities of the finest blackberries, raspberries, currants, gooseberries, etc., are grown and succeed wherever planted. Small fruits have few or no active enemies in Montana, and the future possibilities for the industry are very great.

The reports show that the orchards of the state are practically free from serious disease or insect pests, and it is the hope and belief of the

board that with constant care and watchfulness this freedom can be maintained. No other state can make this showing in the matter of tree and fruit pests.

There is in course of preparation a table showing the exact number of packages of fruits of all varieties imported into the state and that received from Montana points for shipment in the state. These figures are gleaned from the railway companies' reports and when completed will afford growers and shippers with valuable data as to the markets of the state, showing the actual consumption for the whole state.

It has been impossible to include in this report a complete statement of any point, excepting Butte, but the figures as gathered at that point show in a forcible way the large importation and the yet small quantity of fruit that Montana supplies to the state. It also shows the enormous task that confronts the board in the way of inspection of all green fruits imported into the state.

FRUITS RECEIVED IN THE CITY OF BUTTE OVER ALL TRANSPORTATION LINES, SHOWING STATES RECEIVED FROM WITH AMOUNT

Report of Fruit Inspected at Butte, Mont., From Oct. 1, 1899, to Sept. 30, 1900, Inclusive.

	Total Pkgs.
CALIFORNIA—Apples, 41,533; Pears, 5,640; Peaches, 18,136; Plums and prunes, 12,184; Grapes, 23,724; Quinces, 133; Oranges, 21,516; Lemons, 11,515; Misc., 2,990	137,371
OREGON—Apples, 1,525; Pears, 379; Peaches, 50; Plums and Prunes, 92	2,046
WASHINGTON—Apples, 12,219; Pears, 2,550; Peaches, 6,202; Plums and Prunes, 6,464; Grapes, 16; Misc., 1,252	28,703
IDAHO—Apples, 6,542; Pears, 365; Peaches, 294; Plums and Prunes, 1,257	8,458
MONTANA—Apples, 16,103; Pears, 1; Plums and Prunes, 322; Grapes, 25; Misc., 26	16,477
UTAH—Apples, 159; Pears, 111; Peaches, 3,104; Plums and Prunes, 1,025; Misc.,8	4,407
NEW YORK—Apples, 323;Grapes, 6,000; Misc., 1	6,324
IOWA—Apples,	183
ILLINOIS—Lemons,	18

RECAPITULATION SHOWING NUMBER OF PACKAGES OF EACH VARIETY AND WEIGHTS OF FRUIT RECEIVED AT BUTTE.

Kind of Fruit.	No. of Pkgs.		Weight Pkg.	Total Weight.
Apples	78,587	@	50	3,929,350
Pears	9,046	@	50	452,300
Peaches	27,786	@	21½	597,399
Plums and Prunes	21,344	@	26	554,944
Grapes	29,765	@	25	669,125
Quinces	133	@	50	6,650
Oranges	21,516	@	72	1,549,152
Lemons	11,533	@	84	968,772
Misc. Fruit	4,277	@	25	106,925
Total				8,834,617

The results of the inspection of fruits in the markets of the state have been very satisfactory and beneficial. The quality and cleanliness and comparative freedom from disgusting worms and scale of the fruit found in our markets this year is very noticeable as compared with previous years. This has come about not so much from the condemnation and destruction of a few hundred packages of fruit, as from the deterrent effects of a knowledge of the law and the fear of destruction upon the importation of such diseased or infested goods. It is now generally known that bad fruit is in danger of being destroyed if shipped here, so a much better grade is brought in, greatly to the benefit of the consumer as well as to the protection from infection of the Montana orchards.

There have been inspected under the provisions of the law prior to September 1st, over 300,000 packages of fruit, of which number 1,138 packages were condemned and destroyed. In addition, several carloads that were found to be very badly infested were at once removed from the state by owners as an alternative to being destroyed.

There was not as much friction between the inspectors and shippers and dealers as might have been expected. The necessity and benefits of the inspection were recognized by nearly every one, though some whose fruit was condemned were loud in their denunciations.

Mr. W. K. Semple, who has been the fruit inspector located at Butte, has had the largest amount of work to do, and has proven himself very efficient, and the greatest reliance can be placed in his judgment, discretion and firmness. The same can be truthfully said of Mr. E. N. Brandegee, who has carried out the work of inspection at Helena. Both have been hampered in their work by the lack of means, the board being unable to appropriate sufficient money for their needs.

An Itemized Statement of All Moneys Received and Disbursed by the State Board of Horticulture From February, 1899, to November 30, 1900:

ACCOUNT.	District	Board Members Expenses District	Inspector Services District	District Expenses	General Expenses
J. H. Edwards	5	$ 50 50	.....	.....	.....
I. D. O'Donnell	1	59 45	.....	.....	.....
S. M. Emery	2	29 70	.....	.....	.....
D. E. Bandmann	4	78 70	.....	.....	.....
Paris Gibson	3	10 00	.....	.....	.....
C. H. Campbell	3	41 60	.....	.....	.....
W. B. Harlan	4	.....	$580 00	.....	.....
W. F. Traphagan	2	.....	65 00	.....	.....
H. C. Colville	445	.....	245 00	.....	.....
I. D. O'Donnell	1	.....	93 70	.....	.....
E. E. Parsons	5	.....	380 58	.....	.....
Geo. R. Metler	2	.....	14 50	.....	.....
C. H. Campbell	3	.....	75 00	.....	.....
Dr. E. V. Wilcox	2	5 00	.....	.....	.....
C. H. Edwards	..	.....	.....	.....	$1750 00
W. B. Fawcett	4	.....	94 56	.....	.....
R. A. Cooley	2	.....	332 50	.....	.....
D. E. Bandmann	4	.....	584 45	.....	.....
E. N. Brandegee	2	.....	318 18	.....	.....
W. K. Semple	2	.....	599 50	.....	.....
Leslie Wood	4	.....	50 00	.....	.....
General Inspection Expenses	..	.....	.....	$140 54	.....
First District Expenses	..	.....	.....	10 50	.....
Second District Expenses	..	.....	.....	33 05	.....
Fourth District Expenses	..	.....	.....	39 00	.....
Fifth District Expenses	..	.....	.....	52 80	.....
Printing, Etc	..	.....	.....	.....	299 00
Postage, Etc	..	.....	.....	.....	57 18
Sec'y Exp. Supplies	..	.....	.....	.....	56 90
Totals	.	$274 95	$3432 97	$275 89	$2163 08

RECAPITULATION.

State Appropriation		$6600 00
Expense Board Members Districts	$ 274 95	
Services Inspectors Districts	3432 97	
District Expenses	275 89	
General Expenses	2163 08	$6146 89
State Appropriation Balance	453 11	

Bills Entered on the Secretary's Books, to Be Audited by the Board.

W. K. Semple	$450.00
Jno. G. Evans	2.25
D. E. Bandmann	99.85
Helena Hotel	72.00
R. A. Cooley	80.00
J. E. Allen	97.50
J. H. Leyson	137.00
E. N. Brandegee	50.00
Total	$988.60

STATEMENT OF FEES RECEIVED AND DISBURSED UNDER RULES 13 AND 15.

Total amount of fees collected from Oct. 21 to Nov. 24, 1900.....$934.00
Total amount paid out for inspection as per vouchers in hand..... 903.58

Balance on hand..... ..$ 30.42

Report on the Condition of Montana Orchards as Regards Insects.

By R. A. Cooley, Inspector-at-Large to the Board.

The following report on the condition of Montana orchards as regards injurious insects embodies the writer's personal observations in the state and contains facts contributed by the various inspectors of the board. A list of twenty-one species of injurious fruit insects is reported and while it is more than probable that others of importance are here undetected it is fair to assume that as a rule those causing the most damage are the ones discovered. On fruit trees, as on all vegetation, insects of no economic significance are always to be found. Numerous species of this class have been brought to my attention in various parts of the state, but no mention of them is made in this report.

The various insects that occur on our fruit trees as well as on our small fruits, are discussed separately, as follows:

THE CODLING MOTH—The codling moth has been found in this state in four localities, viz: Missoula, Thompson Falls, Kalispell and Helena. In Missoula it is prevalent in the home orchards of the city and has been found by Mr. Bandmann in orchards a few miles outside the city limits. An orchard of about twenty trees in Thompson Falls has been reported by Mr. Colville as containing the moth. During August, 1900, I received specimen apples from the orchard owned by Mr. Whiteside in Kalispell, which, on examination, were found to contain larvae of this pest. Mr. Parsons, the inspector in Kalispell, was asked to determine the extent of the infestation and report to me. On visiting the orchard he learned that Mr. Whiteside had removed all the fruit from the infested trees and burned it. Mr. Parsons was unable to find any more of the pest. Mr. Brandegee has reported the codling moth as very abundant in crab apple trees in the city of Helena.

We may consider the condition as serious as regards this insect, only in Thompson Falls and Missoula. In Missoula particularly the greatest vigilance is to be urged upon the orchardists. No pains should be spared in fighting the pest.

It is noticeable that the infested localities above mentioned are all in or near large towns. This may be accounted for by the fact that the chances are very much greater for the moth to gain access to orchards in the imme-

diate vicinity of distributing points for fruit or close to warehouses where fruit is stored during the fall or winter, since the moths are almost sure to be present at such points and warehouses.

THE GOOSEBERRY FRUIT WORM—This insect is known to occur in the vicinity of Missoula and Bozeman, and in these places it has been doing serious damage. It is very probable that this insect is present in other localities also.

THE FALL WEBWORM—The fall webworm was found by the writer in an old orchard a few miles south of Missoula in August, 1900. It is a troublesome species and attacks many kinds of trees besides fruit trees. Here and there a limb in an orchard may be defoliated, or in worse cases, whole trees may be stripped of their foliage.

THE STRAWBERRY LEAF-ROLLER—This troublesome insect was found in a garden patch of strawberry plants in the city of Helena. The insect has a very bad name and would prove a very serious pest should it become generally distributed. It occurs throughout Washington and in that state is looked upon as the most destructive insect affecting strawberries.

THE RED HUMPED APPLE-TREE CATERPILLAR—Specimens of this insect were received from Mr. Bandmann in the summer of 1900. Presumably they were taken in the vicinity of Missoula. We have little to fear from this insect, since it is extensively attacked by an Ichneuman fly, which prevents its multiplying to troublesome numbers. The specimens received from Mr. Bandmann were dead from the effects of this parasite.

THE TARNISHED PLANT BUG—This insect is very abundant throughout the state, feeding on a large number of wild and cultivated plants. In the spring of 1900 specimens were received from the Bitter Root valley with the report that the insect was causing extensive injury to strawberry blossoms. The effected blossoms were blighted and failed to develop fruit. It was also stated that the insect had caused injury in the same way in previous years. In years past the insect has been reported as injurious to young fruit trees in various parts of the state.

This insect is native to the state, and we can never hope to exterminate it, occuring as it does on wild vegetation.

THE BOX-ELDER PLANT-BUG—This species was sent to the writer about the middle of September, 1900, from Park City, and was reported as injurious to the fruit of the Silver prune. The insects settled in great numbers upon the trees, and, inserting their beaks into the partly ripened fruit, extracted the juices. The effect upon the fruit was to give the surface to the depth of about an eighth of an inch a somewhat corky appearance, thereby ruining it.

THE WOOLLY APHIS—We have had positive evidence of the presence of this insect in but one locality in the state. In September, 1899, Mr. M. M. McDonald pointed out to me a single tree in the city of Missoula

which was slightly infested with this insect. The tree was dug up and burned, and none of the insects have been seen since. It may be counted as good fortune that this insect is so little known in this state.

THE APPLE APHIS—At present there is no fruit insect so widespread in the state and troublesome to orchardists as this species, commonly known as the green aphis. Nearly every orchard in the state contains the pest, and in many cases it has been very severe on the trees. Numerous natural enemies have been found feeding on the pest, but they are insufficient to prevent it from sometimes becoming very abundant, though they usually hold it in check.

THE PLUM APHIS—The plum aphis has been found in great numbers in the vicinity of Flathead lake and in Bozeman.

THE CHERRY APHIS—This insect has been found generally distributed in Flathead county and on a single tree in Bozeman. It is very probable that the insect and the plum aphis occur in other places in the state, though not yet recognized.

THE CURRANT APHIS—The currant aphis was found in July, 1900, on currant bushes near the Flathead lake. The species is a troublesome one, but may be easily controlled.

THE OYSTER-SHELL BARK-LOUSE—This insect has been definitely reported only from a few orchards in and near Missoula and Kalispell, but there can be little doubt that it occurs in many other old orchards in Montana. It is said to have become very troublesome in the summer of 1900 in an orchard in the Bitter Root valley. This insect need not be looked upon as a very serious menace to the orchards of Montana, since it is easily controlled.

THE PUTNAM SCALE—This insect is a near relative of the San Jose scale, and has been found in a single orchard south of Missoula. The trees affected were not seriously injured, and the presence of the insect in the state need not be looked upon as a very serious matter.

THE WESTERN PULVINARIA—This insect was sent to the Station for determination early in the summer of 1900, having been found occuring in abundance on the shore of Flathead lake. In 1900 it was also received from a gentleman in Dillon.

THE PEAR-LEAF BLISTER-MITE—The pear-leaf blister-mite is probably the worst pest found, occurring on pear trees in the state. It is generally distributed and quite destructive in the vicinity of Missoula, and has been found near Kalispell. This mite spreads slowly, but is often very severe on individual trees.

THE CLOVER MITE—So far as known to me this mite has not been found by the inspectors of the Board of Horticulture, but in a publication of the United States Department of Agriculture (Marlatt, Circular 19, Second Series, Division of Entomology, 1897) it is recorded as present in the state. Besides being at times very destructive to clover and the true grass-

es, it is very injurious to the foliage of stone fruits as well as to apple and pear. It also attacks shade trees.

THE NATIVE CURRANT SAW FLY—During the summer of 1900 this insect became very abundant and destructive in this state, particularly in Flathead county. Wherever the insect appeared it destroyed almost the entire foliage of the bushes. It is a very important insect, and if left to work on the bushes unmolested will ruin them. It is probably quite generally distributed in the state.

THE CURRANT FLY—The currant fly is very abundant and destructive in various parts of the state, particularly in the Gallatin valley. In this valley it is not uncommon to have the entire crop of fruit destroyed by the maggots of the fly. Some growers have dug up their bushes and abandoned growing currants on account of these insects.

THE FLATHEADED APPLE-TREE BORER—This insect has been reported from various points on the west side of the range. No serious outbreak, however, has been brought to our notice.

TENT CATERPILLAR—There is probably at least one species of tent caterpillar feeding on fruit trees in the Bitter Root valley, but since we have received no specimens we cannot name the species.

Several reports of insects boring in strawberry plants in the vicinity of Missoula have reached the office of the entomologist, but no specimens have ever been sent to me, and I am unable to give the name of the insect causing the damage. There may be more than one insect working in this way in strawberries.

It is a significant fact that of the twenty-one injurious fruit insects above recorded in Montana, only a very small proportion are native to the state, by far the majority having been introduced from other localities incidental to commercial practices. Montana's experience in this respect is similar to that of other states in the early history of their fruit culture. During the first few years of fruit growing in a new locality little trouble is experienced from insect pests, but as a result of the continual inflow of nursery stock for the young orchards, and fruit to supply the public until the district can grow its own, insects, which occur on the trees or fruit or are liable to get in the material used for packing, have been transferred to the new locality. Montana has already suffered to the extent above shown, but the number of species introduced into our orchards is small compared to the number which is still liable to be brought in. Many of these insects, like the codling moth, although present in the state, occur in only one or a very few localities, and are liable to be brought into the state and deposited time after time until every apple growing section in Montana is infested.

Comparatively speaking, the orchards of Montana are not in a serious condition, but remarkably free from insect pests of a dangerous nature. Many of the worst enemies to fruit culture, such as the San Jose scale, plum curculio and peach borer, which are all well known on account of the damage

they are capable of doing and have done, have not yet been found in Montana. Dr. J. A. Lintner has compiled a list of three hundred and fifty insects known to feed on apple alone. True, only a fractional part of this number need be looked upon as serious enemies to this tree, but we can safely state that the number of species known to be serious enemies to fruit culture and which are liable to be introduced into this state, is upward of a hundred. The importance, then, of a careful and scientific supervision of the orchards of the state is apparent. In most cases pests can be stamped out before they gain a foothold if they are discouraged in time, and a careful inspection and fumigation of all imported nursery stock is the best safeguard we know of for our protection against the introduction of more pests.

The two most impotant insects that Montana has to fear are the notorious San Jose scale and the codling moth. Either one of these insects, alone, to say nothing of the numerous other species liable to be introduced, is of enough importance to warrant the maintenance of rigorous inspection and quarantine regulations. Practically the only means of distribution the codling moth has is the fruit packages carried from state to state. Possibilities of it being introduced on nursery stock are practically wanting. On the other hand, the most probable way of the San Jose scale being introduced is on nursery stock, since this insect is primarily a bark infesting species. We cannot abandon the inspection of fruits or nursery stock.

The nurseries of the state, so far as they have been visited by the writer, are in prime condition. No insects of a dangerous nature liable to be transmitted with the stock were found, and the trees showed every sign of health and vigor.

REPORT OF INSPECTORS.

The first fruit trees planted in what is now known as Flathead county were brought in by the late George M. Lakin from Puyallup, Washington, in the spring of 1886. Of these trees there are now one Red June and one Red Astrachan apple trees living, also one Pond's Seedling plum. All the others succumbed to the severe winters or climatic conditions peculiar to this region. In the spring of 1887 a number of farmers ordered trees from a Geneva, N. Y., nursery. Among those receiving trees that spring were John M. Foy, Richard Greig,David Bigler, Asher Bros., and D. J. Plume, in the vicinity of what is now Kalispell, and George M. Lakin and Wm. Rains in the vicinity of Flathead lake. L. J. Chapman also planted trees about this time. These men are really the pioneer fruit growers of the Flathead valley. A great many others also purchased trees at this time but through neglect or unfavorable soil conditions their trees died. To Geo. M. Lakin the credit should be given for raising the first apple ever grown in the valley, a Red Astrachan. Nearly all the trees planted at this time were old standard varieties such as Northern Spy, Rawles Janet, Ben Davis, Fall

Pippin, etc. Mr. Lakin informed me but a short time before his death that he had 1500 living trees and that counting the number he had lost from various causes, the trees had cost him $1,000.00. The fruit grower of today, if he will, may profit by the experience of those early planters of trees.

There are at present upwards of two hundrd farmers with orchards planted. The total yield of fruit will amount in value to twelve or fifteen thousand dollars. If all the trees planted in the last ten years had been taken care of properly and had been of the varieties suited to this locality, the fruit crop would be worth at least thirty or forty thousand dollars. It is astonishing to see the proportion of the orchards now growing that are only one to three years of age. The farmers are taking a greater interest in fruit culture than they ever have before. A great many who have planted from seventy-five to one hundred trees remark: "If I can only grow enough fruit for my own use I will be satisfied," apparently not realizing that from three-fourths to one acre of land occupied by those few trees will in a short time yield more clear profit than any ten acres of the farm.

The orchards are very free from dangerous insect pests. One orchard near Kalispell has codling moth. Fourteen trees bore fruit infested with moth. The apples were gathered and burned, the trees were marked and next spring will be sprayed as will all other trees in their near vicinity. The green aphis were very bad in all portions of the county and there was more spraying done than ever before. The best results were obtained with whale oil soap and tobacco and with a carbolic mixture sold here which costs about 2½ cents per gallonof spray. Kerosene emulsion, when properly made, has given good results, but so few have soft water that they have trouble in preparing it. In some portions of the county, the currant worms made their appearance this year. The use of hellebore was only partially effective. I have recommended the use of arsenical preparations next spring, which will probably prove more effectual.

The number of fruit trees in the Fifth district is between sixty and seventy thousand, over two-thirds of which have been planted in the last three years. I have inspected two hundred eight orchards containing 45,546 apple trees, 1861 pear trees, 3318 plum trees, 2820 cherry trees and 15 peach trees, making a total of 53,560 trees inspected. There are at Tobacco Plains in the neighborhood of 3,000 trees, and in the vicinity of Troy and Libby as many more, and allowing for a few orchards set out in the past spring, which were missed, will bring the total above 60,000 trees. Tobacco Plains is about ninety miles distant; also Libby and vicinity and could not be visited this year. Two orchards were found infested with the oyster shell bark louse and one young orchard had a few codling moth. The pear leaf blister mite is very numerous in the vicinity of Flathead lake. Never before have the green aphis infested the trees as they have the present year. The fruit growers have invested in spray pumps until the supply was exhausted here in Kalispell, just when spraying was needed

most. The majority of fruit growers will spray earlier next season than they have heretofore.

The inspection of green fruit was resumed June 1st, of this year, when Mr. Fay Thompson was appointed deputy inspector for Kalispell. The number of packages of fruit inspected to October 1st is 4,098 and one car load of 450 boxes.

The fruit inspection regulations of the State Board are being complied with, and have the support of every dealer in the county. The dealers of Libby applied for the apointment of a deputy at that point. C. R. Downing was appointed. Dallas Haskill was appointed deputy at Columbia Falls. When this system of inspection and collecting fees was first inaugurated, the dealers all grumbled and complained, but after one year's trial there are no heartier supporters of the Horticultural law than the merchants of this district. With the commission houses of other states, however, the law is unpopular which tends to show that the rules laid down by the State Board are being enforced and are benefitting the consumer of fruit as well as the grower of fruit here, and also the dealers.

E. E. PARSONS,
Inspector Fifth District.

Kalispell.

Mr. C. H. Edwards, Secretary State Board of Horticulture, Missoula, Mont.

Dear Sir:—In making up a report as Inspector for First District, I find a great many obstacles.

First—It has been impossible for me to inspect either fruit or orchards in Dawson, Custer, Park, Sweet Grass, or Carbon counties, owing to the great distance and small compensation and did not deem it wise to appoint deputies in these counties on account of fund, thinking that the larger fruit growing sections were much more in need of the funds. There have been a great many trees planted in this district the last two years, the largest number for any one county going to Carbon county, where about three car loads were sold this year. These trees mostly having been inspected at Missoula.

Yellowstone county set out about two car loads of trees this year, Sweet Grass and Park about a car load between them. A great many small fruits have been planted, such as currants, blackberries, raspberries, strawberries, etc.

Fruit trees so far are mostly clean but some of the older orchards are beginning to show signs of codling moth, this season being a very long and extremely dry and hot one. A great many new pests have shown up on all our shade trees, especially the cottonwood, which has heretofore been considered free from all pests.

The trees in this district, nearly all being young, have not as yet borne

much fruit. Five hundred boxes will cover the production of the whole district, which is all consumed at home.

I have kept a careful lookout for fruit in the Billings market which is the distributing point for this district, and find the fruit for this year has been much better than last and that but very little infected fruit of any kind has been offered here.

A careful estimate of trees grown in this district I think would be about 50,000 apple trees, 2,5000 plums, 2,500 cherries and 2,500 miscellaneous.

Yours Respectfully,

Billings.

I. D. O'DONNELL
Inspector First District.

To the Hon. State Board of Horticulture:

Sirs:—During the past four months I have inspected all the orchards (with very few and minor exceptions) of Ravalli county.

This is pre-eminently the fruit growing county of the state. Here the first fruit trees were planted on the farm of Thos. Harris on Three Mile creek—ten miles from Stevensville—in 1866 and I found some of those trees still living and bearing fruit although long since turned out to live or die in a tough timothy sod, and, strange to say, they showed no sign of insect or fungus pest.

Here the first commercial orchard was started by Bass Bros., and brought into profitable bearing. And it is in this county that probably three-fourths of all the trees in the state are now growing and bearing.

It was in Ravalli county that the first organization of fruit growers was perfected and the first fruit fair held.

I find that there are now in the county about 350,000 fruit trees living, the vast majority of which of course are apples.

While comparatively few of these trees are in soils or situations that would prevent them making profitable orchards, yet I find that a very large number of them are being so neglected or abused, that they will never be of any profit to their owners and will be a disgrace to the farm.

Many orchards that have had good care while young and until they came into full bearing, were then given over to grass, which was either grazed or cut for hay. This treatment especially if accompanied by the usual lack of water is sure ruin to any orchard.

I am satisfied from experience and observation that clean cultivation during the spring and early summer is not only best, but necessary for young orchards; that vegetables may be grown between the rows without serious injury but that grain is worse than weeds or even grass.

While this is true of young orchards I find that it is not always necessary or best to give bearing trees clean cultivation.

I find many profitable orchards that are in clover, but I find that where the clover is either pastured or cut for hay the trees show injury and lack

vigor while if it is allowed to rot on the ground they often grow and bear as well as where cultivated. I find that in many instances, too late and thorough cultivation of old orchards has resulted in much worse injury from winter's cold, than where they have been forced into a too tender growth.

This season there is a large crop of apples in Ravalli county, but on many trees the fruit is small and inferior owing to overbearing of trees that lack vigor because of the injury of the winter of 1898-99.

But the bulk of the fruit is of good size and firm in appearance and quality. In some neighborhoods the fruit is much specked and injured by hail which was unusually severe and wide spread the past summer.

From the winter's injury of a year ago most trees are recovering wonderfully and all trace of it will be covered up in another year except where the interior is exposed by a broken limb. This interior is universally black hearted and in some cases half rotten.

This improved condition is especially noted in young trees, all of which are making a vigorous growth.

The hardiness of the different varieties was put to the test and as a result many kinds have been eliminated from the list of those desirable to plant. In the list of those not safe to plant except in very favorable locations are Baldwin, Haas Jonathan Cooper's Market, Early June, King of Tompkins County, Rhode Island Greening, Newtown Pippin, Rox Russet, Spitzenberg, Geniton, Mann, Wine Sap, Rambo, and many others of the sorts most grown in the eastern states.

The sorts found most hardy were Duchess, Wealthy, Alexander, Yellow Transparent, Red Astrachan, Gano, Ben Davis, N. W. Greening, Longfield, Peter, Edison, Antonooka and several others, mostly Russian.

The most desirable varieties yet found in tree and fruit are early or autumn kinds. If we had a winter Duchess, Wealthy or Alexander, we would be more than satisfied.

Except the green aphis no insect or fungus pest has been found of a serious nature. Some web worm was found in the northern part of the county, but it is so easily destroyed it can become no serious menace. No codling moth or San Jose scale was found. The few cases of oyster shell scale found last year had been destroyed by burning the trees. Some pear trees showed something similar to leaf blister mite but as the trees were vigorous and bearing full crops of good fruit I do not consider it a serious matter, especially as it can be kept under control by spraying.

The green aphis is a serious pest to our orchards, and one that is universally distributed, not only here but everywhere where fruit is grown.

Its total eradication has been found impossible, but it may be kept under control by constant spraying. I do not think the Board should try to enforce any ironclad rules against it, as extermination is impossible and it would be hard to draw the lines between the allowable few, and the prohibited many.

Taken as a whole I consider the orchard industry in this part of the state to be in a very satisfactory condition, and with the proper care and oversight of the State Board of Horticulture and its inspectors there is no good reason why it should not continue so.

Its growth in the past five or six years is enormous and at the present rate of increase will in a very few years be one of the most important industries of the state.

That it is well worthy the fostering care of our state government is beyond dispute.

Not only are the interests of the producers concerned but of the consumers also, who are entitled to their money's worth of good, clean, wholesome fruit, free from worms or poisonous fungi. Respectfully submitted,

W. B. HARLAN,
Inspector Fourth District

Como.

That inspection is necessary is clearly demonstrated by result of the last year. Butte receives and distributes about eighty per cent. of the fruit shipped into the state, in which is contained an average of fifteen to twenty per cent infection. By proper and constant inspection, and adoption of proper measures, this infected stock can be confined to districts in which there are no orchards, and at the same time avoid working a hardship on the shippers.

Inspection has also proven a benefit to the consumer—in keeping out of market wormy fruit, and placing a good sound stock on sale. As a proof, it is claimed by a prominent commission company in Butte, that the benefit is not only the consumers' but also the dealers'; that in the fall of 1898 the market was glutted with a lot of wormy fruit which so kept down the price of good fruit, that there was hardly a living profit to be had, but by the introduction of inspection this class of fruit was kept out of the market in 1899 either through condemnation or fear of shippers to court destruction and loss.

Much discord has been raised unjustly among shippers by the false and malicious misrepresentations of some unscrupulous dealers in this district; facts were misrepresented, and action of inspector distorted to the detriment of good work, and to cover unfair dealing of consignee.

One instance in particular is that of a commission house in Butte writing to a shipper in Oregon that so long as inspection was enforced at Butte he (shipper) should not ship to this point, that it was impossible to ship any fruit which would not be condemned. To another, a shipper in Washington, the statement was made that he would have no trouble if he shipped to this particular house; that they "stood in" with the inspector, and that no fruit shipped them would be condemned. These statements were made for two reasons—first, to keep out some stock, thus shortening the market and making better prices for the stock on hand, and the other

to obtain consignments from these shippers without opposition from other buyers by representing that no danger attached to shipments to them.

Such misrepresentations as these have had a tendency to antagonize shippers in some districts, to curtail shipments by fear of loss where undeserved, and with other shippers to create the impression that if any house "stood in" with inspectors, unfair treatment must necessarily follow.

It will take time to disabuse the minds of these shippers, but by continued fair treatment and allowance of benefit to shipper where ever possible, this can be overcome, and confidence be gained to such an extent that all growers will know that, if they are reasonable in the selection of stock shipped to this market, they will have no fear of loss by any other than just and legal cause.

It may be pointed out to all shippers that this will be a benefit to them as well as a protection to the state. That when a shipping house demonstrates that they can ship fruit into the state of Montana, that will pass inspection, they can always command a market for their goods; that such a reputation is an advertisement of the quality of their goods.

I would suggest that a circular be gotten up concisely outlining the position to be adopted by inspectors in Montana; showing what fruits may be shipped in here, and assuring all that as long as they ship good fruit they may safely do so without fear of favor or unfair treatment.

When this can have been obtained, inspection in the state of Montana will be reduced to simple matter of a careful supervision of all receipts of fruit with the intended result of protection only.

W. K. SEMPLE,
Resident Inspector.

Butte.

The fruit shipped to Helena has usually been of the first quality and reasonably free from noxious germs. Grapes have been wholly exempt and citrus fruit so far in the season also free. Apples and pears are most infected. The codling moth, one of the most injurious, is also the most frequent germ. I have seen a few cars that had not this pest; but it is almost ubiquitous in pears and apples; and this season at least to keep out codling moth entirely would necessitate depriving the apple market and consumers of a large portion of this fruit.

When a car of fruit arrives in town the inspector is summoned by the consignee to make an examination, to condemn or to pass it and permit it to be sold. The consignee will have nothing to do with it if the fruit will not pass and generally if box goods and the inspector ordered them picked over, there is no one to take the charge of it. So that usually it devolves upon the inspector to condemn or to pass, from an examination of the boxes accessible in the car. So far in my experience these boxes have always been a just sample of all fruit of the same kind in the same car. I examine

these and if the fruit is absolutely free from germs like the San Jose, and reasonably free from codling moth, order it passed; if not, condemn it. As unloading progresses I examine further from time to time of the same lot and all other lots and kinds with extra care, always being satisfied of the exact condition of fruit that is passed, and of each box that is condemned.

Last fall I found San Jose scale on Oregon and California fruit. Since November I have seen none of it. I can truthfully say that since I have been inspector here no fruit has been sold from Helena infected with this germ. Fruit infected with codling moth has often been knowingly passed and sold. So widespread and general is its prevalence, that all an inspector could demand was that fruit should be reasonably free from it. Apple consumers have some rights. The moth infects trees already in this town, and most of the fruit goes to mining camps where a codling moth must eat ore and pine trees or die. All these considerations have influenced me as inspector here. I have been satisfied that the fruit has been as free from this pest as could reasonably be at this time; and that the tendency of it is to become freer and freer under the operation of the inspection law.

Western apples are much more perfect than eastern. Eastern barrel apples have more diseases than all other fruit combined. The apple scab is coming in some on Idaho fruit but nearly every specimen from the east is infected with it and codling moth is very prevalent in them. I have not met with scale on any eastern fruit.

In the discharge of my duties here I have met with the co-operation of the wholesale firms in Helena. They have been so far most concerned with the operation of the law; and to their usual efforts to get the best of fruits has been joined the constant endeavor to get and sell that fruit only that is free from noxious germs. It is due to them as much as to any action of mine that the market is so clear of diseased fruit. All purchases have been made by them with that objet in view.

As the law now stands the inspector receives compensation from fees collected by himself from fruit inspected. This provision should be changed at the next meeting of the legislature, and his salary should be paid by the state through the Board. Inspection is not easily combined with the duties of a publican and a tax gatherer. The wholesalers are patient under the high taxation of business in Montana. To shoulder upon them all the expense of fruit inspection is unjust to them; and the fee interferes with the co-operation of inspector and importer, and is the sole basis of opposition to the law.

Helena is familiar with sheep, cattle and mining industries of the state but does not realize the importance of the horticultural. The fine apples which have appeared here from Ravalli and Flathead, have given those who have seen them an idea of the possibilities of Montana in this direction. For the further protection of the orchard interests it is necessary that this county and many other counties of Montana should know the importance of them

and I hereby recommend that an exhi bition of Montana fruit be held in Helena during the next meeting of the legislature.

E. N. BRANDEGEE,
Fruit Inspector.

Helena.

Mr. C. H. Campbell, Inspector Great Falls District, says:

There are no large orchards in my district and very few trees in bearing yet but a good many farmers and others are putting out a few trees as an experiment. What I have seen seem to be doing well and some are heavily loaded with fruit; but it is impossible for me to give any estimate of the number of trees or the value of this year's product, as we have done no regular inspection work in orchards.

C. H. CAMPBELL.

The following taken from the North Western Horticulturist, published at Tacoma, speaks volumes as to the value of our inspection law:

"The leading shippers of the Pacific Northwest understand that Montana markets require A 1 in quality. Good to fancy prices are cheerfully paid for the choice fruit while poor grades are not wanted at all. Lindsay & Co., who are large receivers and extensive distributors at Helena, say that much fruit and produce of varying grades are shipped to that market without previous knowledge of their wants. They desire that shippers should enter into correspondence before starting any consignments, or withhold the intended shipping.

"Inspection is very rigid there but it is serving to keep any blemished and inferior fruit from coming into competition with the choice goods."

Mr. C. H. Edwards, Missoula, Montana.

Dear Sir:—The legislature may pass all of the laws necessary for the full protection of the horticultural interests and the officers of the law may do all in their power to see that the law is enforced; but unless the individual grower and each person interested in the business of horticulture engages to do his own part faithfully the law will fail in its execution and become nugatory. But if each individual takes a zealous interest in keeping his own orchard free from insects and pests he thereby becomes an active agent in the execution of the law and the extermination of the pests. At the same time he inspires in his neighbor a spirit of emulation and rivalry that is healthful and good to the orchardists throughout the whole state.

If we can impress upon the individual the necessity of care and attention whenever our state is invaded by these pests we will have accomplished a great work in forever preventing them from becoming dangerous or destructive to our orchards. Neglect and failure to attend to the common interests by each individual securing himself against harm begets slovenly methods and in the end works very great injury to the orchardists of the

state and the consequent neglect of the law's mandates; and just as the individual interests are neglected the common interest will languish and perish.

Very Respectfully,

ROBERT B. SMITH,
Governor.

Helena.

Conditions vary so much in this mountain country that it is almost impossible to get the vast amount of information we have gathered boiled down so as to be of use to every one and any one. To begin with I have found causes of success and failure to lie in two main directions, choice of location, and choice of varieties. That is to say the more tender varieties in favorable locations came through the winter of 1898-99 sound to the tips, where the hardiest varieties failed on unfavorable locations. The difference in distance being often a few hundred yards. The most favorable location is a northerly exposure with an easterly shade. That is the slope must be to the north and a mountain or timber belt must shade the ground from the morning sun, in winter especially, till late in the day. This easterly shade seems more important than the northerly slope. Orchards set in cleared land and surrounded by standing timber have as a rule, suffered but seldom, both on account of the shade, and the protection afforded from winds, causing the snow to lie better. The influence of large bodies of water such as the Flathead lake have proved highly beneficial in moderating extremes of temperature and sudden changes.

Thus it is seen why many varieties have been reported dead from one orchard, and as bearing from another, and renders difficult any attempt to cut down our long lists of fruits, especially apples, to a few varieties suitable to our market. Another condition is, I think, very important. Early autumn frosts have this year particularly, and have before, caught all the late keeping apples on the tree over all this western country. A great deal of this fruit did not show enough injury on the outside to prevent marketing, but on cutting open the injury shows, and I have heard many complaints from purchasers. This leads one to question whether Montana fruit growers, who are able to place on the market fall and early winter apples months after they are gone in other states, had not better leave late keepers alone, and by making use of cold storage hold over their fall apples, which can always be gathered before danger of frost and not run the risk of spoiling the market with injured fruit, thinking a frost or two does not hurt the apples.

CHOICE OF VARIETIES—Had it not been for this late frost the late keeper that would have come out in the lead over this district this fall, is the much abused Ben Davis. It has proved perfectly hardy in bud and tree, but the fruit suffered more from the fall frost than any other. McIntosh Red, which was hurt in the Bitter Root valley, has proved perfectly hardy in

my district and will probably remain one of the standards as it keeps fairly well, and is of good quality, maturing before danger of frosts. Yellow Transparent leads, Wealthy following, Duchess and Alexander ranking next. This gives a list of five apples that have proved perfectly hardy. The objections urged against them are earliness and tenderness for shipping in Yellow Transparent. Wealthy, otherwise perfect, drops badly in places. Duchess is too early for most markets. Alexander is too large and lacks in quality. No complaints have been registered against the McIntosh, but Ben Davis fails to mature in most shaded situations, and lacks quality. Next to these Northern Spy has proved perfectly reliable but is late coming into bearing, while Gano and Delaware Red winter have done remarkably well everywhere. There is no lack of suitable early apples and crabs. On the east and west shores of Flathead lake a large number of varieties have fruited this year showing that this is probably the most favorable section in Montana. In regard to stocks for plums there have been many complaints of peach. Plum on plum has proved more satisfactory. Low topped trees have as a rule suffered less than high topped, but where trees have had part of their tops killed back the remaining portion has in many instances seemed unable to utilize the full flow of sap, and many bark injuries resembling sun scald have resulted. The most interesting cases of this sort appear to have occurred to grafts and yearlings, which, although perfectly free from woolly aphis have developed knots and galls on the roots. These diseased portions where occuring above the ground are in some cases unobserved, the skin not bursting but loosening gradually from the trunk. It differs from the crown disease, reported as attacking Baldwins in the eastern states, in the fact that the root is sound. It has been cured by cutting the diseased or loose bark away, and binding up with wax tightly. The sapsucker, aspecies of woodpecker, often attacks these diseased portions. This bird is very destructive to orchards, and observers all agree that it attacks green wood without a sign of a worm or grub on it. It is generally believed to drink or suck the sap hence its name. A life study of this bird would be interesting work for the Biological station on Flatehad lake and fruit growers will welcome an expert statement as to why he pecks perfectly clean orchard trees. The injury seems to affect the tree more than the size of the wound would suggest.

The second pest of importance is the grey pocket gopher. This animal probably kills more trees in my district than any other cause. It does not attacked irrigated orchards as much as non-irrigated. It can be tapped easily in summer but in winter or early spring much damage is done undetected. Alfalfa will attract them, and a field near the orchard seems a protection. The best trap of several I have seen is that made by the Animal Trap Co., Abingdon, Ill. The common steel Newhouse ranking next.

A pine tree borer is reported as very destructive to roots of apple trees on the Missoula river. The tarnished plant-bug is also numerous in places.

A number of pests have attacked strawberries, the root borers being the worst. There are quite a number of leaf-eating worms and caterpillars which however can generally be controlled by hand picking in the younger orchards. The oyster shell bark louse infests nearly all the older orchards in my section, and is a sign of neglect for where the green aphis have been successfully combated there seem few, if any, of the shell.

Borers for all fruits are very common, although the round headed borer of apples does not seem to exist naturally, but comes only in nursery stock.

The codling moth has been found in several orchards at Missoula and Thompson Falls, and is probably only prevented from spreading by the magnificent distances separating orchards in Montana. If owners of infested orchards and their neighbors can be induced to assist, this awful pest can be stamped out of the state. Thorough and careful cultivation is the rule and not the exception in this district, depth though varies from 2 to 6 inches. A few orchards are in sod.

H. C. B. COLVILLE.

Missoula. Inspector Fourth and Fifth District.

To the Honorable State Board of Horticulture:

I found it necessary to appoint in my district assistant inspectors. To facilitate the necessary work I appointed myself as one of them. I have the honor to lay before you as fully as time and space will permit my report. The rigorous action taken last year against the importation of infected fruit stamped out completely, in my district at least, any further importation of the same, and all fruits arriving in Missoula up to date, are clean and healthy, and will remain so as long as the inspection and quarantine system is kept up.

The planting of young trees in my district this year has been very extensive. I have fumigated a great deal of nursery stock. Most of these trees came from the east and Oregon, and some were home products. You will remember that in my report last spring I spoke of a number of orchards in and around Missoula having been more or less infected with the codling moth, especially some old orchards where the pests hibernated for years. According to the law, I notified early last spring all owners and agents of such homes and orchards to spray with paris green emulsion immediately after the blossoms had dropped. I found (with one or two exceptions) every one willing to do so, and most of them made private arrangements with me to spray their trees for them. I sprayed 74 homes and three orchards, consisting in all of about 9,000 trees. Besides myself I employed two young men from the University and carefully watched the dropping of the petals, using a barrel sprayer drawn by a team of horses, whereever I could get through the rows, and where I could not, I took refuge to the bucket sprayer. I made my formula from four to eight ounces of paris green to fifty gallons of water, and two pounds of slacked lime. I took great care to test

the paris green of the Ohio Experiment Station. As it is not always possible to wait for pleasant weather under certain conditions I sprayed between rain and sunshine. After careful inspection this fall I had the satisfaction to find that at least 95 per cent. of the fruit of the trees that had been sprayed was free from any sign of the codling moth. I am therefore convinced that a law (which I have always advocated) making spraying compulsory after the blossoms have fallen, would be the surest guarantee that this state would remain free from the infection of the codling moth. I inspected 115 orchards containing about 88,000 trees, and found them in a generally flourishing condition. Those who took care of their orchards had the satisfaction of good results. Those who did not, had lots of aphis and especially the blister mite on pear trees. Against these pests which threaten to become a serious menace in our state, I recommend compulsory winter spraying with sulphur, lime and salt. I also found the oyster shell bark louse in a few orchards for which I used Prof. Koebler's resin wash with good result. In one instance a condition stared me in the face for which I knew no remedy. I was called upon by Mr. Beck to examine a young orchard of 18,000 trees which had never been irrigated and received its moisture by a careful system of cultivation, and which had been attacked by the grasshopper. The orchard stood in a sandy, gravel soil, on open land, away from all seepage, exposed to the strong rays of the sun, yet in spite of all these drawbacks, was in a vigorous, flourishing condition. The grasshopper having neither weed nor grass to feed upon attacked the foliage, then the twigs, then the bark of the young trees. I asked Prof. Cooley for instructions, but could get no advice or remedy from that quarter, so I used my own ingenuity and appled every possible means to check the enemy. As the orchard was badly infected with the green and black aphis I combined with a strong percentage of paris green and tobacco whale oil soap and quassia chips. I tested the paris green carefully with the usual ammonia test, and found it perfect. I went even further and tried it on the potato bugs, which it killed by the thousands. I made a compound with bran and this same paris green and sprinkled it amongst a drove of grasshoppers and saw them feasting on it as if it were sugar and honey and not one of them gave up the ghost. Whether the University of California in their Bulletin No. 126 regarding the adulteration of paris green is right or not is a question of great importance. Still the damage was checked to at least 75 per cent. by the spraying. This, however, brings up the question whether over-cultivation is not a mistake and whether it would not be better to leave the grasshopper a little green to chew. It may also be of some interest to this Honorable Board that I have tested successfully the tent fumigation on ornamental trees. I found a number of Elm trees surrounding city homes reeking with the brown aphidoe. The curled leaves were filled with myriads of this pest giving the tree a sickly brown look of a living mass of these insects. So enormous was the infection that the ordinary emulsion of kero-

sene or whale oil soap would have been useless. I made up my mind to try tent fumigation and after securing an ordinary 16-foot round tent I closely followed the table given in Bulletin 122 of the University of California. On trees where my tent was too short I attached an ordinary wagon cover. It killed every insect but left the foliage of the tree somewhat bleached. After close examination however I found that the most tender twigs remained in a perfectly healthy condition. The dried leaves all dropped and the bleached leaves after a short time returned to a perfect verdure, and after a couple of weeks the tree having been relieved of its deadly burden returned to new life. I recommend that the Board should order for each district two tents for such serious eventualities.

D. E. BANDMANN,
Missoula. Member Fourth District.

This district, embracing the counties of Gallatin, Broadwater, Beaverhead, Madison, Jefferson, Lewis and Clarke, Meagher and Silver Bow, is in some respects the most important in the state.

Its horticultural possibilities, while being naturally very great, have not been exploited to the best advantage. Enough has been accomplished in an experimental way to prove conclusively that every county, with the possible exceptions of Silver Bow and Deer Lodge, can be made self supporting in the matter of fruit production.

Jefferson, Madison, Gallatin and Broadwater, possess many localities adapted to the fruit production of the hardy standard apples and in all of the counties of the district, the choicest of small fruits can be successfully grown. With the certain information, that in time, the district can but be a heavy producer of choice fruit, the matter of fruit protection from insect and bacterial pests is one of the greatest importance primarily to the farmers and horticulturists, and secondarily to all interested in the financial prosperity of Montana.

The true measure of financial prosperity to the individual or community is the net difference between production and expenditure between income and outgo.

Can Montana be rendered self-supporting in the single item of fruit and the cash that is now paid out to sister states be retained in home circulation, the state will relatively be the gainer of at least $500,000 annually.

While the second district is not the equal of the Fourth and Fifth, in present fruit production, it supplies the market for at least 75 per cent. of the fruit consumed in Montana and as a consumer has the very keenest interest in the law creating this board, and its perpetuation.

Civil law and property rights are founded on the principle of a man being entitled to value received, when he pays his money.

Prior to the creation of this board the consumer was absolutely at the mercy of producer and middle man, who, taking advantage of the imperative

demand of the system for fruit as an important component part of the daily ration, the Montana market was the dump ground for diseased, wormy fruit that was saleable no place else in the United States.

Fruits were deliberately culled out of general packings with a view to their general unworthiness and were foisted on to our markets, and it was understood it was that or none.

With the passage of the law, defective and short reaching as it was, a notable change was at once observed, in the grade and quality of the commodity. True it was not the case until drastic efforts were made to purge shipments of diseased and wormy fruits, but our inspectors have compelled the fruit supply to be improved, until under the law the consumer is fairly well protected.

The law requires amendment in several respects, notably as to the imposition of a small fee to defray the cost of inspection.

Practically our chief inspector has done a large part of his work of inspection free of charge and without compensation, looking to a state legislature that has never yet permitted a faithful officer to serve without reward, to make suitable provision.

In three respects the law must be amended.

FIRST—An unequivocal definition and provision for an inspection fee.

SECOND—Provision for the immediate destruction of diseased and infested fruits, instead of the present option for return of goods to the shipper, or its reshipment to neighboring states.

THIRD—Much contention has been made that owing to the absence of orchards and fruit plantations in Silver Bow, that there can be no danger of contamination in the sale of condemned goods in the city of Butte.

Grave objections exist to this interpretation. First, It is comparatively easy to pass these refuse fruits into other sections of the state, where harm to growing orchards can be accomplished. Second, The fruit consumer of the principal city of the state should have our protection.

I am of the opinion that the consumer is in ignorance often times of the actual condition of the fruit, and is thus defrauded. I would suggest as a remedy, in this case, that the inspector be required by law to place a prominent stenciled stamp upon each package of infested fruit, as follows:

"REJECTED FRUIT FOR LOCAL CONSUMPTION."

This to apply only to Silver Bow and Deer Lodge counties.

Congratulating the board and the citizens of Montana upon the good work done in this the first term of the Board of Horticulture. I remain,

Respectfully,

S. M. EMERY,

Member Second District.

Bozeman.

PROPOSED AMENDMENT TO THE HORTICULTURAL LAW.

At the last meeting of the Montana Horticultural Society, held at Plains, in February, a committee consisting of I. D. O'Donnell, C. H. Campbell, W. B. Harlan, A. L. Stone and C. H. Edwards, were appointed to draft needed amendments to the Horticultural law. At a meeting held in Missoula the committee recommended the following changes in the law. Believing it well to submit the same to the fruit growers of Montana, a meeting was called for that purpose, which was attended by the prominent growers of western Montana and after careful deliberation the work of the committee was adopted.

The proposed amendments are as follows:

Amend Sec. 2 to read as follows: Sec. 2. The state shall be divided into the following horticultural districts: The First district shall comprise the counties of Dawson, Custer, Yellowstone, Sweet Grass, Carbon and Park; the Second district shall comprise the counties of Gallatin, Madison, Jefferson, Beaverhead, Silver Bow, Lewis and Clarke, Meagher and Broadwater; the Third district shall comprise the counties of Flathead, Cascade, Fergus, Valley, Choteau and Teton; the Fourth district shall comprise the counties of Missoula, Granite and Deer Lodge; the Fifth district shall comprise the county of Ravalli.

Amend Sec. 7 to read as follows: Sec. 7. For the purpose of preventing the spread of contagious diseases among fruit aud fruit trees, and for the prevention, treatment, cure and exterpation of fruit pests and the diseases of fruits and fruit trees and for the disinfection of grafts, scions, or orchard debris, empty fruit boxes or packages, and other suspected material or transportable articles dangerous to orchards, fruit and fruit trees, said board may prescribe regulations for the inspection, disinfection or destruction thereof, which regulations shall be circulated in printed form by the board among the fruit growers and the fruit dealers of the state, and shall be published at least ten days in two horticultural papers of general circulation in the state, and shall be posted in three conspicuous places in each county in the state one of which shall be at the county court house thereof.

Amend Sec. 8 by inserting as follows: The said board may appoint one or more, as necessary, competent persons to be known as "Special Fruit Inspectors" whose general powers and duties shall be the same as those prescribed in Sec. 8 to govern "Inspectors of Fruit Pests" and whose especial duty shall be the inspection of the fruit offered for sale in the markets of the state. Such special fruit inspectors shall receive five dollars per day for time actually employed, provided that such compensation shall not exceed the amounts charged and collected as fees for such inspection.

Amend Sec. 9 to read as follows: Sec. 9. It shall be the duty of every person or persons, corporation or corporations, who shall sell or deliver to any person or persons, corporation or corporations, any trees, plants, vines,

scions or grafts, to notify the inspector of said district wherein such trees, plants, vines, etc., etc., are to be delivered, at least five days before said goods are to be delivered, giving the date and nursery or railroad station where said trees, plants, scions, etc., etc., are to be delivered, together with the name of the party or parties who are to receive the same. It shall be the duty of the inspector receiving said notice to inspect the said trees, plants, grafts, scions, etc., etc., as soon thereafter as practicable and at the point where the same are to be delivered, and if the same be found free from any and all diseases or pests, as designated by said State Board of Horticulture, he shall so certify and shall attach such certificate to each lot or bill of such trees, grafts, plants, scions. etc., which said certificate must contain a list of the said trees, grafts, scions, vines or plants so inspected. But if any of the trees, grafts, scions, vines, or plants so inspected shall be found to be diseased or infested with any of the pests, as prescribed by said board, then the inspector shall order the disinfection or destruction of such trees, grafts, scions, vines, etc., etc., so diseased or infested, together with all boxes, wrapping or packing pertaining thereto, provided, that the State Board of Horticulture shall have power to designate certain places as quarantine stations, where all nursery stock brought into the state shall be inspected and disinfected. The State Board of Horticulture shall charge and collect from each nursery inspected the sum of ten dollars; for each car of nursery stock inspected or disinfected the sum of ten dollars, and a proportionate sum for less than car lots, but in no instance less than two dollars for each separate inspection or disinfection. For the inspection of fruits a fee of two cents per box or package with a maximum fee of five dollars for each separate lot or car shall be charged and collected. The inspectors shall collect such fees and shall not give certificates of inspection until the fees are paid.

Amend Sec. 19 to read as follows: Sec. 19. There is hereby appropriated for the use of the State Board of Horticulture, as set forth in this act, out of the moneys in the state treasury, not otherwise appropriated, the sum of Four thousand dollars or as much thereof as may be necessary for the year commencing March 1, 1901, Four thousand five hundred dollars, or as much thereof as may be necessary, for the year commencing March 1, 1902.